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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/743,070	12/23/2003	Tatsuya Uchikawa	OSP-13381CON	7432
21254	7590	01/11/2005	EXAMINER	
MCGINN & GIBB, PLLC 8321 OLD COURTHOUSE ROAD SUITE 200 VIENNA, VA 22182-3817			LEURIG, SHARLENE L	
			ART UNIT	PAPER NUMBER
			2879	

DATE MAILED: 01/11/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	Application No.	Applicant(s)	
	10/743,070	UCHIKAWA ET AL.	
	Examiner	Art Unit	
	Sharlene Leurig	2879	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 23 December 2003.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-4,6-11 and 14-22 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-4,6-11 and 14-22 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 23 December 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☒ Certified copies of the priority documents have been received in Application No. 09/803,655.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)                                   | 4) <input type="checkbox"/> Interview Summary (PTO-413)                     |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)               | Paper No(s)/Mail Date. _____  |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date <u>12232003</u> .  | 6) <input type="checkbox"/> Other: _____                                    |

## DETAILED ACTION

### ***Claim Rejections - 35 USC § 103***

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1 and 2 are rejected under 35 U.S.C. 103(a) as being unpatentable over Barthelmes et al. (5,001,395) (of record).

Regarding claim 1, Barthelmes discloses a high pressure lamp comprising a quartz glass bulb, a conductive element which is airtightly sealed at a sealing portion of the quartz glass bulb, and a pair of electrodes, each electrode of the pair being disposed in a quartz glass bulb so as to be opposite the other and each electrode being connected to the conductive element, wherein a part of each electrode is sealed at a sealing portion so as to generate a contacting portion formed by the part of each of the electrodes and the quartz glass bulb (column 3, lines 3-20). The table in column 3 shows a power rating of 35 W, a length of the electrode from the pinch seal to the edge of the foil of 1.7 mm, and an electrode diameter of 0.25 mm.

The contacting portion length, where the contacting portion is defined as terminating inside and beyond the edge of a foil, is the sum of  $l_E$  and the length of the electrode between the edge of the foil and the termination of the electrode portion overlapping with the foil, which will be referred to as  $l_Q$ . The figures show  $l_Q$  as being less than half the length of  $l_E$ , though the figures are not necessarily to scale.

Using only the known length  $l_E$  (1.7 mm), the relationship between the electrode dimensions and the supplied power fits into the claimed equations. 1.7 mm is less than  $200/(P \times D)$  (which equals 22.6 mm) and greater than  $0.8/(D^2 \times \pi)$  (which equals 1.59).

In order for the total contacting portion length to fit within the claimed ranges, the sum of  $l_E$  and unknown length  $l_Q$  must be less than or equal to 22.6 mm. This means  $l_Q$  may be as long as (22.6 mm - 1.7 mm) 20.9 mm, or more than 12 times the length of  $l_E$ .

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the length of the electrode portion  $l_Q$  overlapping the foil to be less than 20.9 mm and less than the length of the electrode portion  $l_E$  in order to minimize the resistance of the electrode.

Regarding claim 2, the conductive element comprises molybdenum foils (column 3, line 12).

3. Claims 3, 4, 6-11, 15, 16, 19 and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Barthelmes et al. (5,001,395) (of record) in view of Honda et al. (6,249,086) (of record).

Barthelmes discloses a high pressure lamp comprising a quartz glass bulb, a conductive element which is airtightly sealed at a sealing portion of the quartz glass bulb, and a pair of electrodes, each electrode of the pair being disposed in a quartz glass bulb so as to be opposite the other and each electrode being connected to the conductive element, wherein a part of each electrode is sealed at a sealing portion so as to generate a contacting portion formed by the part of each of the electrodes and the

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quartz glass bulb and where the contacting portion terminates inside and beyond the edge of a foil (column 3, lines 3-20).

Barthelmes lacks an electrode surface roughness at the end portion of 5  $\mu\text{m}$  or less. However, Barthelmes recognizes the need for a lamp with a long life (column 1, line 57).

Regarding claims 3, 6, 9-11 and 19, Honda teaches the polishing of the electrode contacting portion to reduce the blackening of the quartz glass bulb and thereby increase the premium life of the lamp. Honda teaches a lamp with an electrode with a maximum surface roughness of 5  $\mu\text{m}$  or less (column 16, line 65). The surface roughness that Honda teaches falls within the claimed ranges of 3  $\mu\text{m}$  or less, 1  $\mu\text{m}$  or less, and 0.5  $\mu\text{m}$  or less. Honda also teaches the use of electrolytic polishing to yield an electrode with the desired surface roughness.

Regarding claim 4, Honda discloses a surface roughness at the contacting portion, but does not disclose the surface roughness to be between 2 and 3  $\mu\text{m}$ . However, it would have been obvious to one of ordinary skill in the art at the time of the invention to make a contacting portion with a surface roughness of between 2 and 3  $\mu\text{m}$ , since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. *In re Aller*, 105 USPQ 233.

Therefore regarding claims 3, 4, 6-11, 19 and 25 it would have been obvious to one of ordinary skill in the art at the time of the invention to modify Barthelmes'

electrode with one with a specified surface roughness via electrolytic polishing in order to increase the longevity of the lamp, as taught by Honda.

Regarding claim 7, Barthelmes discloses the conductive element to comprise molybdenum foils (column 3, line 12).

Regarding claim 8, Barthelmes discloses dimensions for a lamp having a power supply of 150 W in the table in column 3. The length of the tubes (11 and 12) is 4.8 mm, the length of the electrode portion extending from the pinch seal to the edge of the foil is 4.3 mm. Therefore the length of the electrode portion extending into the discharge space and covered by the tube is 0.5 mm. For the dimensions to fit within the claimed range, a length of the contacting portion must be between 1 mm (150/150) and 1.5 mm (150/100) from the end of the electrode. Therefore the extra portion of the electrode from the end of the tube inside the discharge space to the end of the electrode must be between .5 mm (1 mm - .5 mm) and 1 mm (1.5 mm - .5 mm).

Barthelmes fails to disclose the distance from the end of the tube inside the discharge space to the end of the electrode.

It would have been obvious to one of ordinary skill in the art at the time of the invention to make electrodes whose lengths were such that the portion of the electrode from the end of the tube inside the discharge space to the end of the electrode was between .5 mm and 1 mm, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. *In re Aller*, 105 USPQ 233.

Therefore regarding claim 8, it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the lamp of Barthelmes to have an electrode portion from the end of the tube inside the discharge space to the end of the electrode of between .5 mm and 1 mm, in order to minimize the resistance of the electrode shaft while also maintaining a sufficient distance between the electrode tip and the pinch seal, as it has been held to be within the skill of an ordinary practitioner to find the optimum range.

Barthelmes discloses a high pressure lamp comprising a fill of a noble gas, mercury and a mixture of metal halides (halogens) but is silent on the specific amounts of the fill components.

Honda teaches a fill comprising 80 torr of an inert gas (column 17, line 45), which is within the claimed range of 6 kPa or more. Honda also teaches a halogen content within the range of  $0.1 \times 10^{-3}$  to  $2 \times 10^{-3}$  mol/cc, the lower end of which is equivalent to the claimed value of  $10^{-2}$   $\mu\text{mol}/\text{mm}^3$ .

Therefore regarding claims 15 and 16 it would have been obvious to one of ordinary skill in the art at the time of the invention to modify Barthelmes' lamp to have the specified inert gas vapor pressure and the halogen gas amount taught by Honda in order to have a long-lived lamp compatible with the electrode structure.

Regarding claim 22, the contacting portion of Barthelmes is formed by a part of each electrode of the pair of electrodes and the quartz glass bulb.

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4. Claims 14, 17 and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Barthelmes et al. (5,001,395) (of record) in view of Honda et al. (6,249,086) (of record) as applied to claims 3, 4, 6-11, 15, 16, 19 and 22 above, and further in view of Takeuti et al. (6,211,616) (of record).

Barthelmes discloses a high pressure lamp with all the limitations discussed above, but lacks an electrode surface roughness at the end portion of 5  $\mu\text{m}$  or less.

Honda teaches a high pressure lamp with electrodes with a given surface roughness as discussed above.

While Barthelmes teaches a fill of a noble gas, mercury and a mixture of metal halides, he is silent on the specific amounts of the fill components.

Takeuti teaches a mercury fill of 0.12 to 0.35  $\text{mg/mm}^3$ , which corresponds with the claimed amount, in order to have a long-lived lamp (column 3, line 1).

Therefore regarding claim 14, it would have been obvious to one of ordinary skill in the art at the time of the invention to modify Barthelmes' high pressure lamp with electrodes with the surface roughness taught by Honda and further with a mercury fill of 0.12 to 0.3  $\text{mg/mm}^3$  as taught by Takeuti in order to increase the lamp life.

Regarding claim 17, Honda and Barthelmes lack a tungsten electrode comprising potassium oxide. It is well known in the art that halide lamps often encounter tube blackening.

Honda teaches a lamp with electrodes formed from "genuine tungsten or tungsten containing sub-components," but is silent on what the sub-components might be (column 5, line 42).



Takeuti teaches the use of tungsten electrodes that contain potassium oxide, but no more than 12 ppm (column 3, line 10) in order to prevent tube blackening. The combination of the fill components and electrode content achieve a long-lived lamp (column 3, line 1).

Therefore regarding claim 17 it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the high pressure lamp of Barthelmes with an electrode surface roughness as taught by Honda and further with a potassium oxide containing tungsten electrodes as taught by Takeuti in order to increase the life of the lamp and prevent blackening of the tube.

Regarding claim 21, both Barthelmes and Honda disclose lamps with facing electrodes separated by a distance, but neither explicitly discloses the length of the distance.

Takeuti teaches that it is well known in the art to provide electrodes in halide lamps at a distance of 1.0 to 2.0 mm from each other (column 2, lines 23-24) and additionally teaches the spark gap distance of his own invention to be within the claimed range (column 4, line 65).

Therefore regarding claim 21, it would have been obvious to one of ordinary skill in the art at the time of the invention to modify Barthelmes' lamp with an electrode surface roughness as taught by Honda in order to increase the life of the lamp and prevent blackening of the tube and to modify it further with a spark gap distance as taught by Takeuti as Takeuti has taught it to be well known in the art.

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5. Claim 18 is rejected under 35 U.S.C. 103(a) as being unpatentable over Barthelmes et al. (5,001,395) (of record) in view of Honda et al. (6,249,086) (of record) as applied to claims 3, 4, 6-11, 15, 16, 19 and 22 above, and further in view of Genz (5,635,796) (of record).

Barthelmes discloses a high pressure lamp with all the limitations discussed above, but lacks an electrode surface roughness at the end portion of 5  $\mu\text{m}$  or less.

Honda teaches a high pressure lamp with electrodes with a given surface roughness as discussed above.

Neither Barthelmes nor Honda teach a lamp with a bulb wall load of 0.8  $\text{W}/\text{mm}^2$  or more. However, Barthelmes teaches the need for a lamp with an increased lifetime (column 1, line 57).

Genz teaches the use of a high pressure lamp with a combination of characteristics that result in a longer lamp life, including a wall load between 40 and 85  $\text{W}/\text{cm}^2$ , which is equivalent to the claimed amount of 0.8  $\text{W}/\text{mm}^2$  or more.

Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the high pressure lamp of Barthelmes with an electrode surface roughness as taught by Honda and further with a wall load of 0.8  $\text{W}/\text{mm}^2$  or more as taught by Genz in order to increase the life of the lamp.

6. Claim 20 is rejected under 35 U.S.C. 103(a) as being unpatentable over Barthelmes et al. (5,001,395) (of record) in view of Sugitani et al. (6,271,628) (of record).

Barthelmes discloses a high pressure discharge lamp with a mercury fill and all the limitations discussed above, but lacks disclosure of the length of the electrode from the edge of the pinch seal to its end overlapping the foil.

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the length of the electrode portion  $l_Q$  overlapping the foil to be less than 20.9 mm and less than the length of the electrode portion  $l_E$  in order to minimize the resistance of the electrode.

Barthelmes further lacks explicit disclosure of the internal pressure of the lamp.

Sugitani teaches the well-established method of increasing the pressure of a lamp in order to prevent arcing (column 1, lines 28-30), which is a well-known problem in the art, and specifically teaches an internal pressure of 110 atm (column 7, line 67), which is equal to 11MPa, which is within the claimed range of 8MPa or more.

Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to modify Barthelmes' high pressure lamp to have an appropriate electrode portion length in contact with the foil in order to minimize resistance of the electrode, and to further modify it to have an internal pressure of 8MPa or more in order to prevent arcing, as taught by Sugitani.

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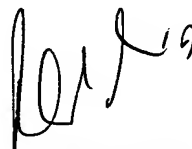
### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Sharlene Leurig whose telephone number is (571) 272-2455. The examiner can normally be reached on Monday through Friday, 8:30am-5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nimesh Patel can be reached on (571) 272-2457. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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**NIMESHKUMAR D. PATEL  
SUPERVISORY PATENT EXAMINER  
TECHNOLOGY CENTER 2800**